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EXAMINER	
TAKEUCHI, YOSHITOSHI	
ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@choate.com

Office Action Summary	Application No.	Applicant(s)	
	10/583,183	MORENCY ET AL.	
	Examiner	Art Unit	
	YOSHITOSHI TAKEUCHI	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-21 and 31-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-21 and 31-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-4, 6-21, and 31-33 are presented for examination, wherein claims 1-3, 6 are currently amended. Claims 5 and 22-30 are cancelled

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 24, 2009 has been entered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims **1-10**, **16**, **31** and **32** are rejected under 35 U.S.C. 103(a) as being obvious over Jebrak et al. (Michel Jebrak, Maurice Morency & Denise Fontaine, Characterization of Steel Dust from the Sorel-Tracy Region and Technologies for their Treatment, Centre de Recherche en Environnement (1993)) in view of Matthews et al. (US 5,227,349).

a. Regarding claims **1** and **6**, Jebrak teaches a hydrometallurgical process (page i, paragraph 8) for the treatment of steel mill arc furnace dust (page i, paragraph 1) containing agglomerates of small ferrite particles and larger magnetite particles (page i, paragraph 7 discloses micron-sized ferrite and magnetite particles. Bulk particles are present in a range of sizes, while the exact population of particle sizes differs depending on the means of production, it is inherent that when two populations of particles are of the same order of size, that some particles of one population will be larger than the particles of the other particle population), the ferrite particles coating by adsorption the larger magnetite particles (an inherent characteristic of ferrite particles and magnetite particles is that when the ferrite particles are in close proximity of the magnetite particles, the ferrite particles will tend to be adsorbed to the magnetite particles), the dust further

containing lime (which is composed of calcium oxide) and lead (page i, paragraph four, where applicant admits that electric arc furnace dust contains dangerous levels of soluble lead (page one, paragraph 2), and Stephens teaches a method of processing still mill arc furnaces (page i, paragraph 1)), together with minor elements selected from the group consisting of Cd and chlorides (page i , paragraph five). The Jebrak process comprises the steps of: (**a**) washing the arc furnace dust in water (Figure 8.2, where the powder is washed in a wet drum), said washing step being performed under agitation (washing is agitation, page 13, paragraph 6 and with an alkaline pH (page 13, paragraph 6); (**b**) decanting the solution of step (a) (filtering implies pouring liquid from one container to another container, Figure 8.4); (**c**) separating the slurry and the supernatant liquid (Figure 8.4, where filtering implies separating the slurry and supernatant liquid); and (**e**) treating the slurry from step (d) to produce pigments selected from the group consisting of ferrite pigments, magnetite pigments and ferrite/magnetite pigments (page 33, paragraph 6, which describes making steel dust, composed of ferrite and magnetite—compositions with inherently vibrant colors, available to the pigment and paint industries).

Jebrak suggests adding a deflocculant (page 3, paragraph 7) and an appropriate dispersant (page 33, paragraph 8) as a means of improving the separation of magnetite and ferrite particles. However, Jebrak does not expressly teach using an anionic surfactant on the slurry obtained in step (c).

Matthews teaches sodium metaphosphate is a known deflocculant (11:48-49), and a deflocculant is used to separate particles that would otherwise adhere, such as ferrite particles adsorbed on the magnetite particles.

As a result, it would have been obvious to a person of ordinary skill at the time of the invention to add sodium metaphosphate to the hydrometallurgy process taught by Jebrak as a dispersing agent in order to keep the particles separated, since sodium metaphosphate is a known dispersing agent, as taught by Matthews.

b. Regarding claim **2**, Jebrak in view of Matthews teaches the method of claim 1, wherein Jebrak teaches possibility of combining successive treatments. (Page 3, paragraph 6).

c. Regarding claims **3** and **4**, Jebrak in view of Matthews teaches the method of claim 1, wherein Jebrak teaches the use of an appropriate dispersant (page 33, paragraph 8) and separating different mineral phases after neutralization of the charge effect at the particles[‘] surface (page 1, paragraph 5). By neutralizing the charge effects of the particles, the zeta potential (the degree of repulsion between adjacent, similarly charged particles) is reduced to zero, which is the isoelectric point (the point where molecules carries no net electric charge).

d. Regarding claim **7**, **10** and **16**, Jebrak in view of Matthews teaches the method of claim 1, wherein Jebrak teaches magnetically separating the slurry into a first fraction composed essentially of ferrite, which intrinsically has brown coloring, and a second fraction composed essentially of magnetite, which intrinsically has a black coloration, the first fraction being less magnetic than the second fraction. (Figure 8.2 and page 13, paragraph 7, Magnetic separation of ferrite from magnetite, where pigment is understood to be a substance capable of being used for adding a characteristic color, such as brown or black).

e. Regarding claims **8** and **9**, Jebrak in view of Matthews teaches the method of claim 1, wherein Jebrak teaches the use of a magnetic field using 1,000 gauss, but does not teach the use of an electric field in the range of 400 to 700 gauss. However, absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to use a magnetic field in the range of 400 to 700 gauss, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

f. Regarding claim **31**, Jebrak in view of Matthews teaches the method of claim 6, wherein Jebrak teaches magnetically separating the slurry into a first fraction composed essentially of ferrite, which intrinsically has brown coloring, and a second fraction composed essentially of magnetite, which intrinsically has a black coloration, the first fraction being less magnetic than the second fraction. (Figure 8.2 and page 13, paragraph 7, Magnetic separation of ferrite from magnetite, where pigment is understood to be a substance capable of being used for adding a characteristic color, such as brown or black).

g. Regarding claim **32**, Jebrak in view of Matthews teaches the method of claim 31, wherein Jebrak teaches the use of a magnetic field using 1,000 gauss, but does not teach the use of an electric field in the range of 400 to 700 gauss. However, absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to use a magnetic field in the range of 400 to 700 gauss, since it has been held that where the general conditions of a claim are disclosed in the prior art,

discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

7. Claims 11-15, 17-21, and 33 are rejected under 35 U.S.C. 103(a) as being obvious over Jebrak et al. (Michel Jebrak, Maurice Morency & Denise Fontaine, Characterization of Steel Dust from the Sorel-Tracy Region and Technologies for their Treatment, Centre de Recherche en Environnement (1993)), in view of Matthews (US 5,227,349) and further in view of Hitzrot, Jr. (US 4,190,422).

a. Regarding claim **11**, Jebrak in view of Matthews teaches the method of claim 10, wherein Jebrak teaches treating particles with a solvent, to obtain a leached slurry (Figure 8.4) and filtering said leached slurry into a solid fraction (Figure 8.4, "dry filtrate") that contains ferrite pigments (pigments from page 21, paragraph 4) and a liquid fraction (Figure 8.4, "filtering liquid"). Jebrak does not teach removing particles having a grain size of 20 um or more or drying said solid fraction.

Hitzrot teaches sieving particles prior to wet grinding to ensure only particles of certain sizes will be treated, and Hitzrot also teaches drying the particles after wet grinding. (Abstract and Figure 1). As a result, it would have been obvious to one skilled in the art at the time of the invention to filter out particles having a grain size of 20 um or more and drying them, since Hitzrot teaches that steel mill waste product can have useful commercial uses if they are purified and separated by grade (abstract and 1:60-64) and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

b. Regarding claim **12**, Jebrak in view of Matthews teaches the method of claim 11, wherein Jebrak teaches water as a solvent with ferrite pigments. However Jebrak does not teach the use of ferrite pigments that are of a first grade.

Hitzrot teaches sieving the dried particles multiple times to create batches of particles with discrete particle sizes.

As a result, it would have been obvious to one of ordinary skill in the art at the time of the invention to create a batch of ferrite particles after wet grinding and sieving in order to create a batch of particles with particle sizes that would satisfy a first grade specification since Hitzrot teaches that steel mill waste product can have useful commercial uses if they are purified and separated by grade (abstract and 1:60-64) and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

c. Regarding claim **13**, Jebrak in view of Matthews teaches the method of claim 11, wherein Jebrak teaches the use of 12 M sulfuric acid, which has a pH of -1.08, as a solvent in acid leaching (Figure 8.3) but does not teach ferrite pigments that are of a second grade, where "grade" is a pigment classification.

It would have been obvious to one of ordinary skill in the art at the time of the invention to create a batch of ferrite particles after wet grinding and sieving in order to create a batch of particles with particle sizes that would satisfy a second grade specification since Hitzrot teaches that steel mill waste product can have useful commercial uses if they are purified and separated by grade (abstract and 1:60-64) and it

has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

In addition, absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to perform leaching at a pH of 0.5 to 3.0, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

d. Regarding claim **14**, Jebrak in view of Matthews teaches the method of claim 11, wherein Jebrak teaches the use of 12 M nitric acid, which has a pH of -1.08, as a solvent in acid leaching (Figure 8.3), but does not teach ferrite pigments that are of a third grade. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to create a batch of ferrite particles after wet grinding and sieving in order to create a batch of particles with particle sizes that would satisfy a third grade specification since Hitzrot teaches that steel mill waste product can have useful commercial uses if they are purified and separated by grade (abstract and 1:60-64) and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

e. Regarding claim **15**, Jebrak in view of Matthews teaches the method of claim 14, wherein Hitzrot teaches wet grinding to a finer mean grain size, which after magnetic separation would inherently lead to a ferrite population with a lower concentration of

lead. As a result, it would have been obvious to a person of ordinary skill at the time of the invention to wet grind the particles in order to prepare ferrite particles with particle sizes that would satisfy the fourth grade specification since Hitzrot teaches that steel mill waste product can have useful commercial uses if they are purified and separated by grade (abstract and 1:60-64) and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

f. Regarding claim **17-18**, Jebrak in view of Matthews teaches the method of claim 16, wherein Jebrak teaches filtering (Figure 8.4) and providing for successive treatments (page 3, paragraph 6). Hitzrot teaches reprocessing particles that are too coarse and fine by sending them back to the mill for processing. (Abstract and Figure 1).

As a result, it would have been obvious to a person of ordinary skill at the time of the invention to screen particles having a grain size of 6 um or less to the mill in the Jebrak process since these particles do not meet the required pigment sizes for the grades, but can be used to recover iron, and this avoids the expense of disposing of the hazardous waste product and particles.

Also, it would have been obvious to a person of ordinary skill at the time of the invention to send the coarse particles with grain sizes greater than 40 um or more back for further wet grinding, rather than to the mill, since where the particles have a marketable value, and is not merely a byproduct, the particles are the closest starting material to making the pigments.

g. Regarding claim **19**, Jebrak in view of Matthews teaches the method of claim 17, wherein Jebrak teaches filtering and drying (Figure 8.4) and separating out the magnetite (page i, paragraph 7 and page 1, paragraph 4, where magnetic separation separates the ferrite and magnetite particles) Hitzrot teaches wet grinding particles and screening prior to drying (abstract and Figure 1).

It would have been obvious to a person of ordinary skill at the time of the invention to wet grind ferrite and magnetite particles to the order of 0.3 um grain size, since Hitzrot teaches that steel mill waste product that have population of particles having sizes within a controlled range can have useful commercial uses if the particles of specific sizes, such as particulates used for blast cleaning metallic surfaces (1:60-64).

Also, absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to filter out particles having a grain size meeting the first grade specification, since Hitzrot teaches that steel mill waste product can have useful commercial uses if they are purified and separated by grade (abstract and 1:60-64) and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

h. Regarding claim **20**, Jebrak in view of Matthews teaches the method of claim 17, wherein Jebrak suggests using a colloidal washing to purify the particles (page 35, paragraph 1, the teaching of purifying the particles implies decanting the liquid, since the particles would not be purified until removed from the liquid), use of a deflocculant (page

3, paragraph 7), filtering, and drying the slurry (Figure 8.4). Hitzrot teaches wet grinding the particles.

It would have been obvious to a person of ordinary skill at the time of the invention to wet grind ferrite and magnetite particles to the order of 0.3 um grain size, since Hitzrot teaches that steel mill waste product that have population of particles having sizes within a controlled range can have useful commercial uses if the particles of specific sizes, such as particulates used for blast cleaning metallic surfaces (1:60-64).

i. Regarding claim **21**, Jebrak in view of Matthews teaches the method of claim 1, wherein Jebrak teaches treating particles with a solvent, to obtain a leached slurry with 12 M nitric acid (Figure 8.4) and filtering said leached slurry into a solid fraction (Figure 8.4, "dry filtrate") that contains ferrite and magnetite pigments (pigments from page 21, paragraph 4) and a liquid fraction (Figure 8.4, "filtering liquid." Jebrak does not teach removing particles having a grain size of 60 um or less or drying said solid fraction. However, Hitzrot teaches sieving particles prior to wet grinding to ensure only particles of certain sizes will be treated, and Hitzrot also teaches drying the particles after wet grinding. (Abstract and Figure 1).

It would have been obvious to a person of ordinary skill at the time of the invention to wet grind and then dry the ferrite and magnetite particles in order to prepare them for further sieving, since Hitzrot teaches that steel mill waste product can have useful commercial uses if they are purified and separated by grade (abstract and 1:60-64).

Absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to filter out particles having a grain size of

60 um or less, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

j. Regarding claim **33**, Jebrak in view of Matthews teaches the method of claim 32, wherein Jebrak teaches treating particles with a solvent, to obtain a leached slurry (Figure 8.4) and filtering said leached slurry into a solid fraction (Figure 8.4, "dry filtrate") that contains ferrite pigments (pigments from page 21, paragraph 4) and a liquid fraction (Figure 8.4, "filtering liquid"). Jebrak does not specify removing particles having a grain size of 20 um or more or drying said solid fraction.

Hitzrot teaches sieving particles prior to wet grinding to ensure only particles of certain sizes will be treated, and Hitzrot also teaches drying the particles after wet grinding. (Abstract and Figure 1). Hitzrot teaches this waste product has useful commercial uses, such as an abrasive for use in machine or manual blast cleaning (column 1, lines 60-64).

It would have been obvious to a person of ordinary skill at the time of the invention to apply the step of wet grinding and then drying the ferrite and magnetite particles, as disclosed by Hitzrot, in the method of Jebrak, in order to prepare them for further sieving, as disclosed by Hitzrot since it teaches if the steel mill waste particles are purified and separated by grade, the waste product can have useful commercial uses (column 1, lines 60-64).

Also, it would have been obvious to a person of ordinary skill at the time of the invention to send the coarse particles with grain sizes 20 um or more back for further wet

grinding, rather than to the mill, since where the particles have a marketable value, and is not merely a byproduct, the particles are the closest starting material to making the pigments.

Response to Arguments

10. Applicant's arguments with respect to claims 1-4, 6-21, and 31-33 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOSHITOSHI TAKEUCHI whose telephone number is (571) 270-5828. The examiner can normally be reached on Monday-Thursday 9:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/

Supervisory Patent Examiner, Art Unit 1793

/YOSHITOSHI TAKEUCHI/
Examiner, Art Unit 1793